



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,175	02/24/2004	Yukitoshi Sanada	249224US6	9281

22850 7590 07/13/2007  
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
----------

TSE, YOUNG TOI

ART UNIT	PAPER NUMBER
----------	--------------

2611

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

07/13/2007

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

## Office Action Summary

Application No.

10/784,175

Applicant(s)

SANADA ET AL.

Examiner

YOUNG T. TSE

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 13 is/are pending in the application.
- 4a) Of the above claim(s) 9-12, 14 and 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Figure 4, corresponding to claims 1-8 and 13 in the reply filed on May 7, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Applicants simple traverse the Election Requirement has not established that an undue burden would be required if the Election Requirement was not issued and if all the claims were examined together and merely cite the MPEP §803 which states: If the search and examination of an entire application can be made without serious burden, the Examiner must examine it on the merits, even though it includes claims to independent or distinct inventions.
2. Claims 9-12 and 14-15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on May 7, 2007.

### ***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Information Disclosure Statement***

4. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered. ***See page 5, lines 5-10 of the specification.***

***Drawings***

5. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

6. The disclosure is objected to because of the following informalities: The detailed description of the prior art Figures 1-3 discussed under the Summary of the Invention should be described under the Description of Related Art since Figs. 1-3 are prior art figures. Appropriate correction is required.
7. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

8. Claims 1-8 and 13 are objected to because of the following informalities:

In claim 1, line 7, "carrier restoring section" should be "a carrier restoring section"; lines 8, 21 and 25, "said carrier" should be "said each carrier"; line 10, "Radio frequency" should be "a radio frequency"; line 12, "signal;" should be "signal,"; line 13, "digital converter" should be "a digital converter"; line 15, "Fourier-transform section" should be "a Fourier-transform section"; line 20, "sub-carrier" should be "a sub-carrier"; line 24, "power controlling section" should be "a power controlling section"; and lines 25 and 26, "section connected to said receiving antennas," should be "section,".

In claim 4, line 2, there should be a space between "," and "wherein".

In claim 7, line 2, there should be a space between "," and "further"; line 4, "open/close switch" should be "an open/close switch".

In claim 8, line 4, "sub-carrier" should be "a sub-carrier"; line 10, "antenna" should be "an antenna".

Wherein the dependent claims 2-3 and 5-6 depend either directly or indirectly upon the independent claim 1.

In claim 13, lines 19-21, "step, said Fourier-transforming step, and comparing step performed corresponding to said plurality of receiving antennas," should be "step, and said Fourier-transforming step,".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 3-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The configuration of claims 3 and 5-6 contains subject matter which does not correspond to the disclosure of Figure 4 and was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. For example, claims 3 and 5-6 recite the power controlling section (22) selects an antenna (11) of a received signal.

Art Unit: 2611

However, as shown in Fig. 4, the switch controlling section (23) controls the switches (12-1 to 12-L) to select one of the antennas (11-1 to 11-L).

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1-8 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, lines 13-14, the digital converter lacks connection or cooperation with the radio frequency and intermediate frequency section. Also see claim 13, lines 8-9.

In claim 7 (line 5), claim 8 (line 6), and claim 13 (lines 22-23), the terms said carrier restoring sections" and "said sub-carrier selecting step" both lack antecedent basis.

Wherein the dependent claims 2-6 depend either directly or indirectly upon the independent claim 1.

### ***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 1-8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crawford et al., U.S. Publication No. 2003/0002471A1 (hereinafter "Crawford") in view of the Fig. 2 of the instant application.

Crawford discloses an OFDM diversity receiver in Fig. 1 comprising a plurality of antennas (A1 to A6), switches (101), RF receivers (104, 106), and a diversity antenna selection and sub-carrier selection diversity module (108).

Fig. 17 illustrates a block diagram of an exemplary diversity antenna branch selection module (550) which may be used in the diversity antenna selection and sub-carrier selection diversity module (108) of Fig. 1.

Figs. 18A and 18B illustrate exemplary implementations of a sub-carrier selection diversity module (602) and a diversity antenna selection module (600), respectively, which may be used in the diversity antenna selection and sub-carrier selection diversity module (108) of Fig. 1.



Regarding claims 1, 4, 8 and 13, the OFDM receiver comprises a plurality of receiving antennas (A1-A6); a carrier restoring section or an RF receiver (104 or 106) provided for each of the plurality of receiving antennas, wherein each of the RF receivers discloses a Fourier-transform section or an FFT only as shown in Fig. 18A; a sub-carrier selecting section (550 of Fig. 17, 602 of Fig. 18A, 600 of Fig. 18B) for comparing powers of output signals from the carrier restoring section provided for each sub-carrier, and selectively combining the powers of the output signals for each sub-carrier; and a power controlling section (550 of Fig. 17, 602 of Fig. 18A, 600 of Fig. 18B) for controlling power supplied to the carrier restoring section connected to the receiving antennas, based on sub-carrier selection information from the sub-carrier selecting section. Although Crawford does not explicitly show or suggest that each of the RF receivers (104 or 106) comprise a radio frequency and intermediate frequency section for down-converting a reception signal from a radio frequency band to a base band signal and a digital converter for converting an analog base band signal of the RF and IF section into a digital signal to the FFT circuit, it is inherent or well known to a person skill in the art that any receiver, such as the RF receiver (104 or 106) is capable of including an RF and IF section for converting a radio digital into an intermediate signal and a digital converter for converting the analog intermediate signal into a baseband digital signal prior converting the baseband digital signal to a Fourier transform circuit, wherein most Fourier transform circuits are performed in digital manner.

The prior art Figure 2 of the instant application also shows that an RF front end receiver includes an RF and IF circuit (130) and an A/D converter (14) prior the transform section DFT (15).

Therefore, it would have been obvious to one of ordinary skill in the art as taught by the prior art Fig. 2 of the instant application that Crawford's RF receiver (104 or 106) is capable of including an RF and IF section and an A/D converter for down converting the RF signal into IF signal first and converting the analog IF signal into digital signal in order for the FFT circuit to process the transformation of the digital signal.

Regarding claim 2, again, it is inherent or well known to a person skill in the art as shown in the prior art Fig. 2 of the instant application that an interleaver (6) and a decoder (7) are used in an OFDM receiver after the selection and combination of the diversity channels, for instant, for error correction of the received signal.

Regarding claims 3 and 5-7, the selection of the antennas or the power control of the RF receivers is controlled by the diversity antenna branch selection module (550) of Fig. 1, the sub-carrier selection diversity module (602) of Fig. 18A and/or the diversity antenna selection module (600) of Fig. 18B.

**Conclusion**

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Namekata et al. relates to an adaptive variable directional antennas suitable for a radio communication system that performs a radio transmission of a digital signal sequence using OFDM system.

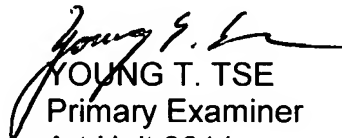
Sano et al. relates to a receiver comprises time despread sections which perform time despread for each sub-carrier signal, and sub-carrier group demodulation processing sections which perform frequency despread for each sub-carrier signal after the time despread.

Ido relates to a diversity receiver comprises a power ratio comparator that calculates a difference value as a ratio of power derived from channel estimation results for subcarrier components received from two antennas and compares the calculated difference value with a predetermined threshold.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOUNG T. TSE whose telephone number is (571) 272-3051. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
YOUNG T. TSE  
Primary Examiner  
Art Unit 2611